

WHAT IS CLAIMED IS:

1. A nanotube to which is attached a component linked to a label compound capable of being induced to luminesce.
2. A nanotube according to claim 1, wherein said nanotube is graphitic and said luminescence is electrochemiluminescence.
3. A graphitic nanotube according to claim 1, wherein said component is an enzyme biosensor.
4. A composition for the detection of an analyte of interest present in a sample, which composition comprises:
 - (i) a graphitic nanotube containing a functional group and
 - (ii) an assay-performance-substance linked to said functional group, said assay-performance-substance being capable of binding to the analyte-of-interest.
5. A composition for the detection of an analyte of interest present in a sample, which composition comprises:
 - (i) a graphitic nanotube containing a functional group and
 - (ii) an assay-performance-substance linked to said functional group, said assay-performance-substance being bound to the analyte of interest.
6. A composition according to claim 5, further comprising a second assay-performance-substance bound to the analyte, said second assay-performance-substance being linked to a label compound capable of being induced to luminesce.

7. A composition according to claim 4, wherein said assay-performance-substance contains at least one substance selected from the group consisting of

- (i) added analyte of interest or added analogue of said analyte;
- (ii) a binding partner of said analyte or a binding partner of said analogue; and
- (iii) a reactive component capable of binding with the selected substance.

8. A composition according to claim 6, wherein said assay-performance-substance contains at least one substance selected from the group consisting of

- (i) added analyte of interest or added analogue of said analyte;
- (ii) a binding partner of said analyte or a binding partner of said analogue; and
- (iii) a reactive component capable of binding with the selected substance.

9. A method for performing a binding assay for an analyte of interest present in a sample comprising the steps of:

- (a) forming a composition containing
 - (i) said sample
 - (ii) an assay-performance-substance linked to a label compound capable of being induced to luminesce, and
 - (iii) a plurality of functionalized graphitic nanotubes bound to an assay-performance-substance;
- (b) incubating said composition to form a complex which includes a graphitic nanotube and said label compound;
- (c) collecting said complex in a measurement zone;

(d) inducing the label compound in said complex to luminesce, and

(e) measuring the emitted luminescence to measure the presence of the analyte of interest in the sample.

10. A method as recited in claim 9 wherein said complex is collected on the surface of means for inducing luminescence and measuring said luminescence.

11. A method as recited in claim 10 based upon measurement of electrochemiluminescence wherein said complex is collected at an electrode surface.

12. A method for performing a binding assay for an analyte of interest present in a sample based upon measurement of electrochemiluminescence at an electrode surface comprising the steps:

(a) forming a composition containing

(i) said sample

(ii) an assay-performance-substance linked to a label compound capable of being induced to electrochemiluminesce, and

(iii) a plurality of functionalized graphitic nanotubes bound to an assay-performance-substance;

(b) incubating said composition to form a complex which includes a graphitic nanotube and said label compound;

(c) collecting said complex;

(d) causing said collected complex to come in contact with an electrode surface and inducing the label compound in said complex to luminesce by impressing a voltage on said electrode; and

(e) measuring the emitted luminescence at the electrode surface to measure the presence of the analyte of interest in the sample

13. A method for performing a binding assay for an analyte of interest present in a sample based upon measurement of electrochemiluminescence at an electrode surface comprising the steps:

- (a) forming a composition containing
 - (i) said sample
 - (ii) an assay-performance-substance linked to a label compound capable of being induced to electrochemiluminesce, and
 - (iii) a plurality of magnetically responsive suspended graphitic nanotubes bound to an assay-performance-substance;
- (b) incubating said composition to form a complex which includes a graphitic nanotube and said label compound;
- (c) collecting said complex by imposition of a magnetic field on said graphitic nanotubes;
- (d) causing said collected complex to come in contact with an electrode surface and inducing the label compound in said complex to luminescence by imposing a voltage on said electrode; and
- (e) measuring the emitted luminescence at the electrode surface to measure the presence of the analyte of interest in the sample.

14. A method as recited in claim 13 wherein the imposition of said magnetic field causes said complex to collect at the surface of said electrode.

15. A composition of matter for use as a reagent in a microparticulate-based binding assay comprising functionalized graphitic nanotubes bound to an assay-performance-substance and at least one other component selected from the group consisting of:

- (a) electrolyte;
- (b) label compound containing an ECL moiety;

- (c) analyte of interest or an analog of the analyte of interest;
- (d) a binding partner of the analyte of interest or of its analog;
- (e) a reactive component capable of reacting with (c) or (d);
- (f) a reductant; and
- (g) an electrochemiluminescent-reaction enhancer; provided, however, that no two components contained within any reagent composition are reactive with one another during storage so as to impair their function in the intended assay.

16. A reagent as recited in claim 15 containing magnetically responsive graphitic nanotubes.

17. An assay reagent for an assay based upon a binding reaction and the measurement of an electrochemiluminescent phenomenon comprising:

- (a) an electrolyte;
- (b) a plurality of magnetically responsive functionalized graphitic nanotubes bound to an assay-performance-substance; and
- (c) an assay-performance-substance bound to a chemical moiety having electrochemiluminescent properties.

18. A method for performing an assay for an analyte of interest present in a sample comprising the steps of:

- (a) forming a composition containing
 - (i) said sample, and
 - (ii) a functionalized graphitic nanotube bound to a component which is bound to a label compound capable of being induced to luminesce, wherein said component is a substrate of the analyte of interest;

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